

CLAIMS

1. A method for manufacturing a power capacitor comprising at least one capacitor element (1), wherein the capacitor element (1) comprises a roll of alternate dielectric films (4) and electrode films (2, 3), wherein the roll has first and second end surfaces (5, 6), facing away from each other, in which said electrode films (2, 3) are connectably exposed, characterized in that a solder tip (21) is preheated in a pot (20) with a preheated solder, that the solder tip is then coated with solder, whereupon at least one of the end surfaces (5, 6) of the capacitor element is coated with at least one solder by bringing the solder tip (21) into contact with said end surface (5, 6), that the contact is brought to cease, and that at least one lead (7, 9) is fixed by soldering to said end surface (5, 6).

2. A method according to claim 1, characterized in that the capacitor element (1) is wound from the electrode films, comprising a first aluminium foil (2) and a second aluminium foil (3), with at least one intermediate dielectric film (4) of a polymer material, wherein the first aluminium foil (2) at the first end surface (5) of the capacitor element is arranged so as to project outside the edge of the polymer film (4), whereas at the same first end surface of the edge of the capacitor element the edge of the second aluminium foil (3) is arranged with its edge inside the edge of the polymer film (4) so that the end (5) of the capacitor element exhibits the shape of a roll of the first aluminium foil (2) only and the second aluminium foil (3) is arranged so that the second end (6) of the capacitor element in a corresponding way exhibits the shape of a roll of the second aluminium foil (3) only, that the solder tip comprises an active tip (26) which is coated with the solder, and that the solder tip (21), after having been brought into contact with the end surface (5, 6) of the capacitor element, is moved along the end surface (5, 6) of the capacitor element.

3. A method according to claim 2, **characterized** in that the movement is carried out in one sequence comprising a starting point (P1), two turning points (P2, P3) between which the solder tip (21) is moved in one or more cycles, and one end point (P4) from which the solder tip (21) is removed from the end surface (5, 6) of the capacitor element, whereby the first or the second turning point (P2, P3) may be the same as the starting point (P1) or the end point (P4).

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10 4. A method according to any of claim 2 or 3, **characterized** in that the speed of movement of the solder tip along the end (5, 6) of the capacitor element is between 0 m/s and 0.1 m/s.

15 5. A method according to any of the preceding claims, **characterized** in that the solder tip (21) when first being brought into contact with the end (5, 6) of the capacitor element presses down the end surface (5, 6) of the capacitor element.

20 6. A method according to claim 5, **characterized** in that the solder tip (21) is pressed down to a depth of between 0 and 6 mm in the end surface (5, 6) of the capacitor element.

25 7. A method according to claim 6, **characterized** in that the solder tip (21) is arranged on a shaft (22), whereby the shaft is journalled in a bearing housing (23) which permits relative axial movement, wherein the depth into which the solder tip (21) is pressed down is determined by the total weight of the solder tip (21) and the shaft (22) and by the friction in the bearing housing (23).

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35 8. A method according to claim 6, **characterized** in that the solder tip (21) is arranged on a shaft (22), whereby the shaft is journalled in a bearing housing (23) that permits relative axial movement, and that the shaft (21) is provided with a compression spring (27), whereby the depth into which the solder tip (21) is pressed down is determined by the total weight of the solder tip (21), the shaft (22) and the

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compression spring (27), the friction in the bearing housing (23) plus the compression of the compression spring (27).

9. A method according to any of the preceding claims,

5 **characterized** in that the solder tip (21) is arranged on a shaft (22), whereby the solder tip (21) during the pre-soldering is brought to rotate in the direction of rotation of the shaft (22).

10 10. A method according to claim 9, **characterized** in that the solder tip (21) is brought to rotate in one or the other direction of rotation, or that the rotation is reversing.

11. A method according to claim 10, **characterized** in that the 15 rotation is less than one complete turn, that is, is less than 360°.

12. A method according to any of the preceding claims, **characterized** in that the temperature of the solder in the 20 solder pot is in the interval of between 300 °C and 400 °C.

13. A method according to any of the preceding claims, **characterized** in that the solder contains tin and zinc.

25 14. A method according to claim 13, **characterized** in that the solder contains 75% tin and 25% zinc.

15. Equipment (10) for carrying out the method according to any of claims 1-14, **characterized** in that it comprises a solder pot (20), a solder head (12), whereby the solder head is arranged with a first linear module (13) for movements in the x-direction (horizontally) and a second linear module (14) for movements in the y-direction (vertically), and a press unit (15) for fixing the capacitor elements (1), wherein the 30 solder pot (20), the solder head (12), the first and second (13, 14) linear modules and the press unit (15) are arranged on a steel frame (11).

16. Equipment according to claim 15, characterized in that the solder head (12) is arranged with a solder tip (21) provided with an active tip (26), said solder tip being arranged on a shaft (22) and a turning device (25), whereby the 5 shaft (22) is connected to the turning device (25) with an insulating shaft (24) and whereby the shaft (22) is journaled in a bearing housing (23).

17. Equipment according to claim 16, characterized in that 10 the shaft (22) and the insulating shaft (24) are arranged so that a guide pin prevents relative axial movement.

18. Equipment according to claim 16, characterized in that the shaft (22) and the insulating shaft (24) are arranged so 15 that a guide pin, running in an axial slit, makes possible a relative axial movement.

19. Equipment according to claim 18, characterized in that a compression spring (27) is arranged between the shaft (22) 20 and the turning device (25), whereby the compression spring (27) counteracts the shaft (22) being moved in a direction towards the turning device (25).

20. Equipment according to any of claims 16-19, characterized 25 in that the turning device (25) is arranged so that a rotating movement is transmitted to the solder tip (21).

21. Equipment according to any of claims 16-20, characterized 30 in that the active tip (26) is arranged with a rotationally symmetrical cross section.

22. Equipment according to claim 21, characterized in that the active tip (26) is arranged with a smooth end surface.

35 23. Equipment according to claim 21, characterized in that the active tip (26) is arranged with an end surface with turned circular recesses.

24. Equipment according to claim 21, **characterized** in that the active tip (26) is arranged with recesses so as to form a grid-like pattern on the end surface.

5 25. Equipment according to claim 21, **characterized** in that the active tip (26) is arranged with a cupped end surface.

26. Equipment according to any of claims 16-20, **characterized** in that the active tip (26) is arranged with a rectangular

10 cross section.

27. Equipment according to any of claims 15-26, **characterized** in that the equipment (10) is provided with a Programmable Logic Controller (PLC) and a control panel for controlling

15 the solder pot (20), the solder head (12), the first and second linear modules (13, 14), and the press unit (15).